

WHAT IS CLAIMED IS

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1. An image forming apparatus comprising:
an image bearing member, which is rotatably
supported, to bear a toner image;

a light beam scanning section to simultaneously
10 scan the image bearing member by a plurality of light
beams so as to form an electrostatic latent image on the
image bearing member;

a developing section to develop the electrostatic
latent image into the toner image by supplying a toner
15 to the image bearing member;

a transfer section to transfer the toner image on
the image bearing member onto a recording medium; and

an ON start timing adjuster to adjust an ON start
timing of one of the plurality of light beams, based on
20 an image tone of each of a plurality of patterns of an
image pattern formed by the light beam scanning section.

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Related Pending Application
Related Case Serial No: 10/618,733
Related Case Filing Date: 07-15-03

2. The image forming apparatus as claimed in claim 1, wherein:

the image pattern includes first patterns and second patterns,

5 the first patterns being formed by shifting a first light beam in a main scan direction by one dot with respect to a second light beam and repeating an image pattern formed thereby in a sub scan direction, and further repeating an image pattern formed thereby in the
10 main scan direction at intervals of n dots,

the second patterns being formed by shifting the first light beam in a direction opposite to the main scan direction by one dot with respect to the second light beam and repeating an image pattern formed thereby
15 in the sub scan direction, and further repeating an image pattern formed thereby in the main scan direction at intervals of n dots,

where the main and sub scan directions are approximately perpendicular to each other, and n is
20 greater than or equal to one.

25 3. The image forming apparatus as claimed in

claim 2, wherein the light beam scanning section simultaneously forms the first patterns and the second patterns on the image bearing member.

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4. The image forming apparatus as claimed in claim 3, further comprising:

10 an external input section to instruct output of the first patterns and the second patterns.

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5. The image forming apparatus as claimed in claim 4, wherein the external input section includes an operation panel.

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6. The image forming apparatus as claimed in claim 3, wherein the ON start timing adjuster adjusts
25 the ON start timing so that an image tone difference of

the first patterns and the second patterns on the image bearing member falls within a tolerable range.

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7. The image forming apparatus as claimed in claim 6, wherein the ON start timing of the ON start timing adjuster is adjustable from the external input section.

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8. The image forming apparatus as claimed in claim 7, wherein the external input section includes an operation panel.

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9. The image forming apparatus as claimed in claim 3, wherein the light beam scanning section simultaneously form on the image bearing member a plurality of first patterns having different ON start

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timings and a plurality of second patterns having different ON start timings.

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10. The image forming apparatus as claimed in claim 9, wherein the ON start timing adjuster adjusts the ON start timings for the plurality of first patterns and the plurality of second patterns having tolerable image tone differences to selected ON start timings.

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11. The image forming apparatus as claimed in claim 9, wherein forming of the plurality of first patterns and the plurality of second patterns is instructed from the external input section to the light beam scanning section.

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12. The image forming apparatus as claimed in

claim 11, wherein the external input section includes an operation panel.

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13. The image forming apparatus as claimed in claim 1, further comprising:

10 a detecting unit to detect a toner image tone of the plurality of patterns.

15 14. The image forming apparatus as claimed in claim 13, wherein the ON start timing adjuster adjusts the ON start timing based on the toner image tone detected by the detecting unit.

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15. The image forming apparatus as claimed in claim 13, wherein the detecting unit detects an image
25 tone a toner image of the plurality of patterns on the

image bearing member.

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16. The image forming apparatus as claimed in claim 13, wherein:

the transfer section includes a transfer member to which the toner image from the image bearing member is transferred, and the transfer member transfers the toner image thereon onto the recording medium,

the detecting unit detecting an image tone of a toner image the plurality of patterns on the transfer member.

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17. The image forming apparatus as claimed in claim 1, further comprising:

a detecting unit to detect a latent image potential of the plurality of patterns.

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18. The image forming apparatus as claimed in claim 17, wherein the ON start timing adjuster adjusts the ON start timing based on the latent image potential detected by the detecting unit.

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19. The image forming apparatus as claimed in claim 13, further comprising:

an external input section to instruct forming of the plurality of patterns to the light beam scanning section.

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20. The image forming apparatus as claimed in claim 19, wherein the external input section includes an operation panel.

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21. The image forming apparatus as claimed in

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claim 13, wherein the ON start timing adjuster automatically adjusts the ON start timing at a predetermined period.

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22. The image forming apparatus as claimed in claim 21, further comprising:

10 an external input section to variably set the predetermined period.

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23. The image forming apparatus as claimed in claim 22, wherein the external input section includes an operation panel.

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24. The image forming apparatus as claimed in claim 17, further comprising:

25 an external input section to instruct forming of

the plurality of patterns to the light beam scanning section.

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25. The image forming apparatus as claimed in claim 24, wherein the external input section includes an operation panel.

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26. The image forming apparatus as claimed in claim 17, wherein the ON start timing adjuster automatically adjusts the ON start timing at a predetermined period.

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27. The image forming apparatus as claimed in claim 26, further comprising:

an external input section to variably set the predetermined period.

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28. The image forming apparatus as claimed in claim 27, wherein the external input section includes an operation panel.

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29. The image forming apparatus claimed in claim 1, wherein:

10 the developing section successively develops toner images of different colors on the image bearing member, the transfer section successively transfers the toner images of the different colors onto the recording medium in an overlapping manner to form a color image,
15 and

 the ON start timing adjuster adjusts the ON start timing with respect to plurality of patterns corresponding to the different colors.

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30. The image forming apparatus claimed in claim 1, wherein:

25 the developing section successively develops toner

images of different colors on the image bearing member,
the transfer section includes a transfer member to
which the toner images of the different colors from the
image bearing member are successively transferred to

5 form a color image,

the transfer member transfers the color image
thereon onto the recording medium, and

the ON start timing adjuster adjusts the ON start
timing with respect to plurality of patterns

10 corresponding to the different colors.

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ABSTRACT OF THE DISCLOSURE

An image forming apparatus is constructed to include an image bearing member which is rotatably supported to bear a toner image, a light beam scanning section to simultaneously scan the image bearing member by a plurality of light beams so as to form an electrostatic latent image, a developing section to develop the electrostatic latent image into the toner image, a transfer section to transfer the toner image onto a recording medium, and an ON start timing adjuster to adjust an ON start timing of one of the plurality of light beams, based on an image tone of each of a plurality of patterns of an image pattern formed by the light beam scanning section.

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FIG.1

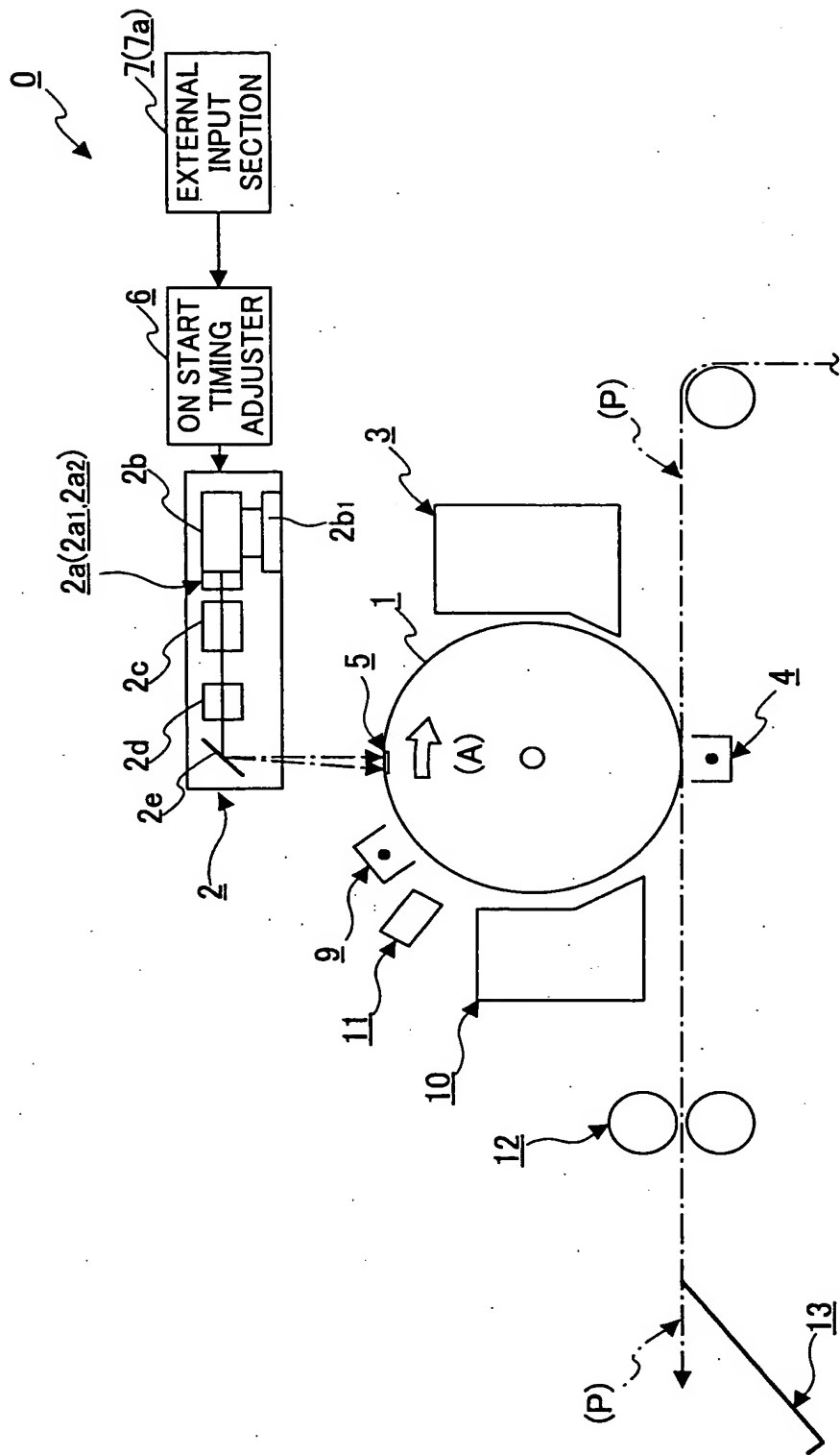


FIG.2

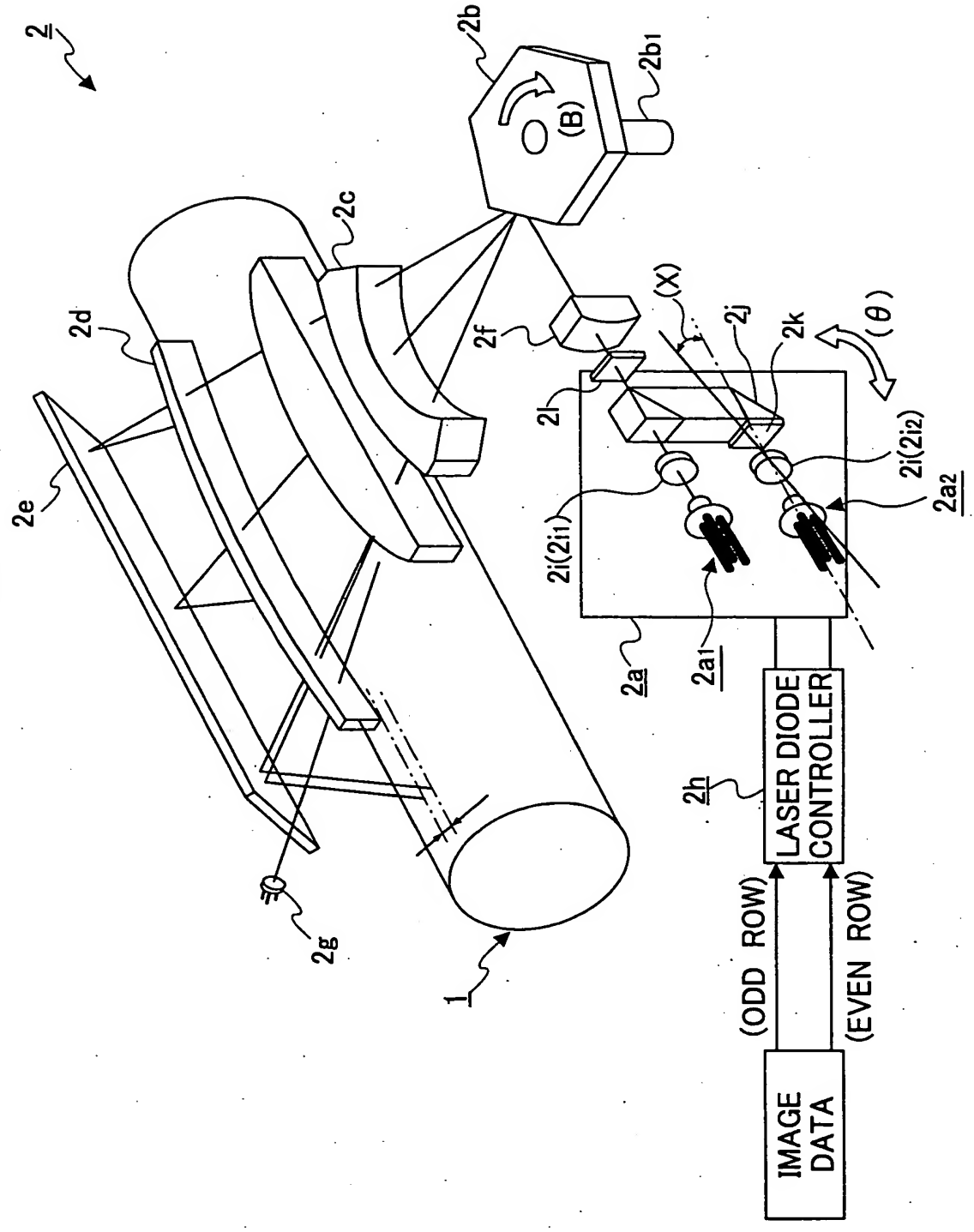


FIG.3

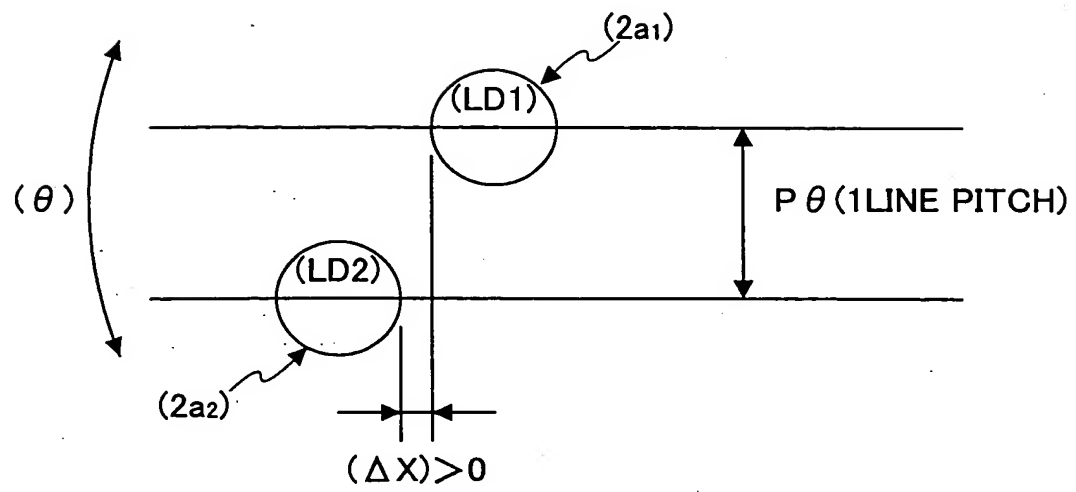


FIG. 4

The diagram illustrates the control and optical paths of a laser printer. At the top, a **PRINTER CONTROLLER** (16) provides a common clock signal (**WCLK**) to a **WRITE CLOCK GENERATOR** (18) and an **ON START TIMING ADJUSTER** (6). The **WRITE CLOCK GENERATOR** (18) outputs a **WCLK** signal to the **ON START TIMING ADJUSTER** (6). The **ON START TIMING ADJUSTER** (6) outputs **/DET P1** and **/DET P2** signals to a **PHASE SYNC CLOCK GENERATOR** (17) and a **SYNC SIGNAL SEPARATOR** (14). The **PHASE SYNC CLOCK GENERATOR** (17) outputs **VCLK1** and **VCLK2** signals to a **LASER DIODE CONTROLLER** (2h) and a **SYNC DETECTING ON CONTROLLER** (15). The **LASER DIODE CONTROLLER** (2h) also receives **IMAGE DATA (EVEN ROW)** and **IMAGE DATA (ODD ROW)** signals. It outputs **BD1** and **BD2** signals to the **SYNC DETECTING ON CONTROLLER** (15). The **SYNC DETECTING ON CONTROLLER** (15) outputs a **2g** signal to a **POLYGON MOTOR CONTROLLER** (19) and a **BEAM PITCH CONTROLLER** (20). The **POLYGON MOTOR CONTROLLER** (19) outputs a **2b** signal to a **POLYGON** (2). The **BEAM PITCH CONTROLLER** (20) outputs a **2a(2a1, 2a2)** signal to the **POLYGON** (2). The **POLYGON** (2) outputs a **2c** signal to a **PHOTOCONDUCTIVE BODY** (1). The **PHOTOCONDUCTIVE BODY** (1) outputs a **5(5a, 5b)** signal to the **SYNC SIGNAL SEPARATOR** (14). The **SYNC SIGNAL SEPARATOR** (14) outputs a **/DETP** signal to the **ON START TIMING ADJUSTER** (6).

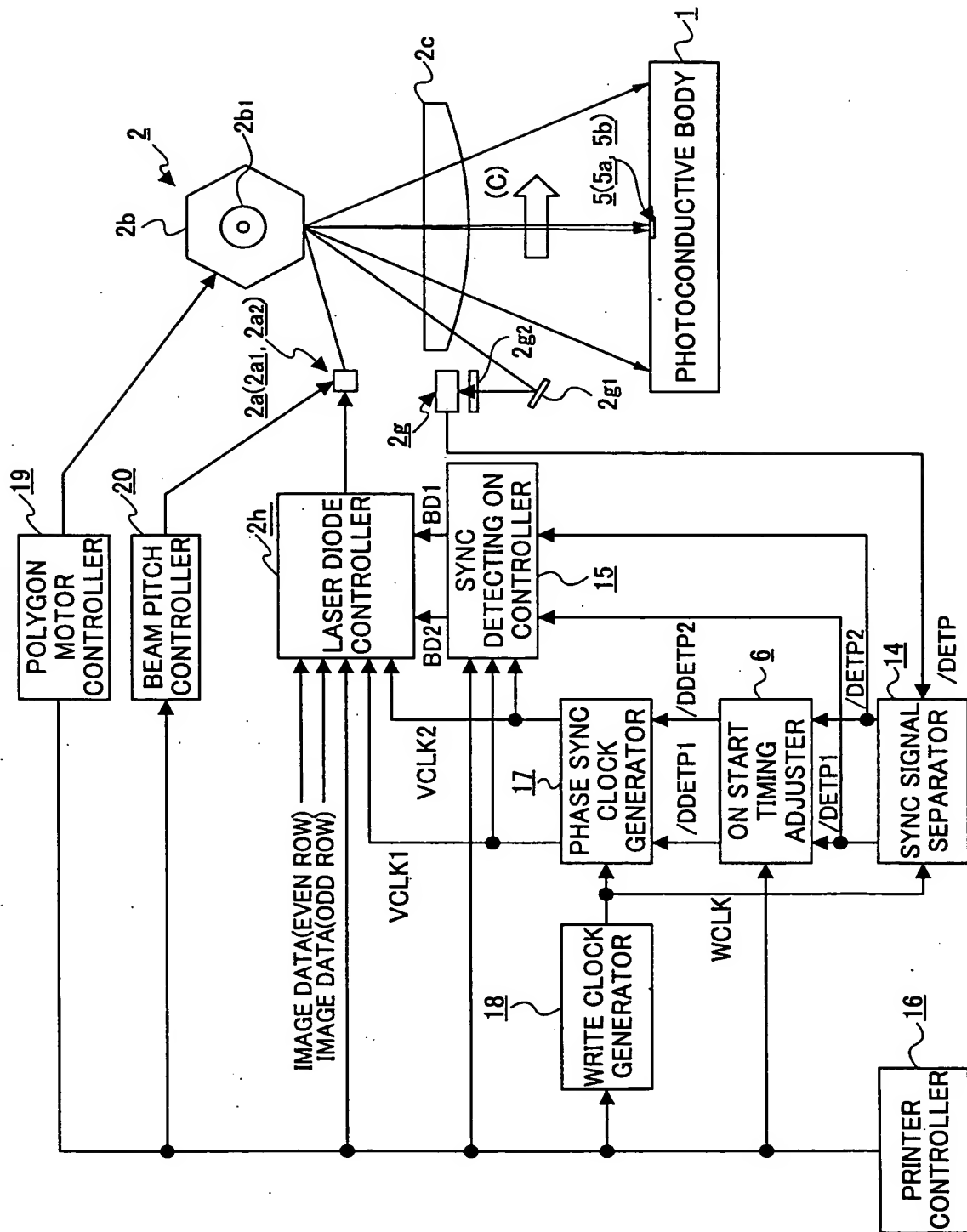


FIG.5

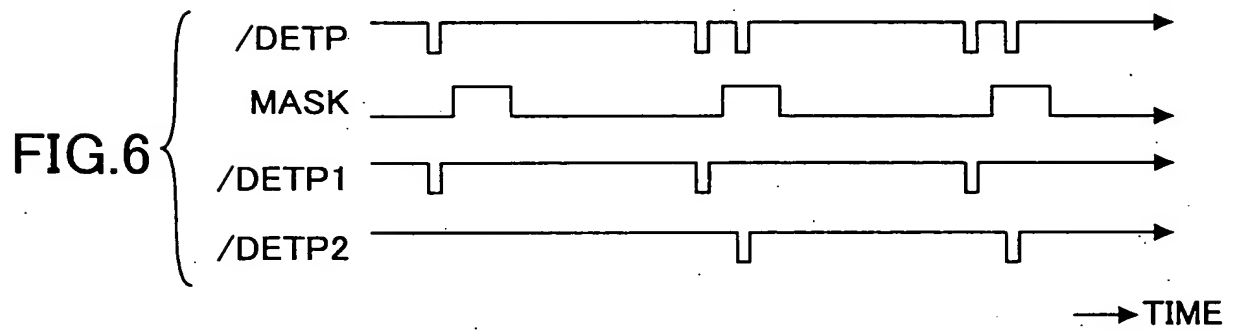
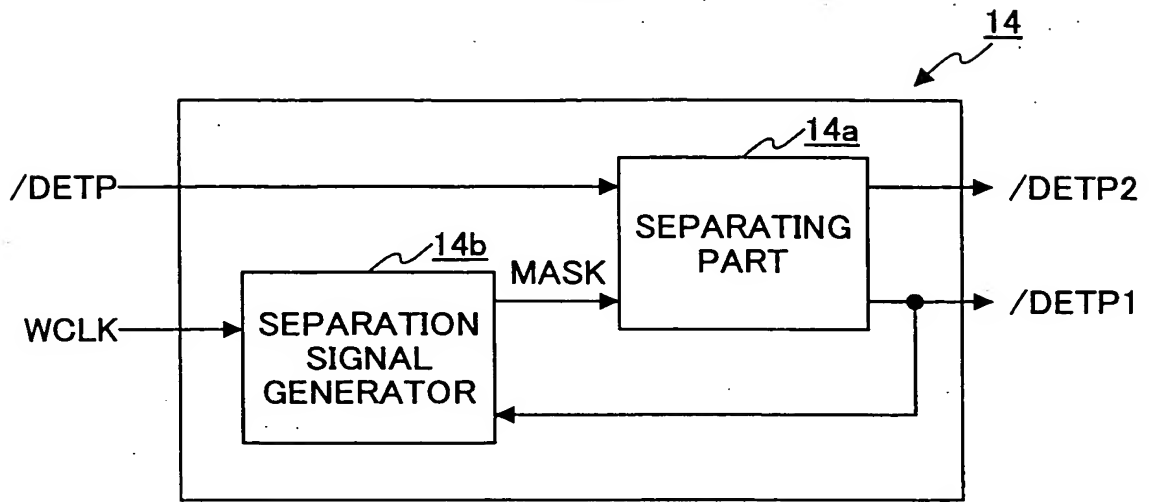


FIG. 7

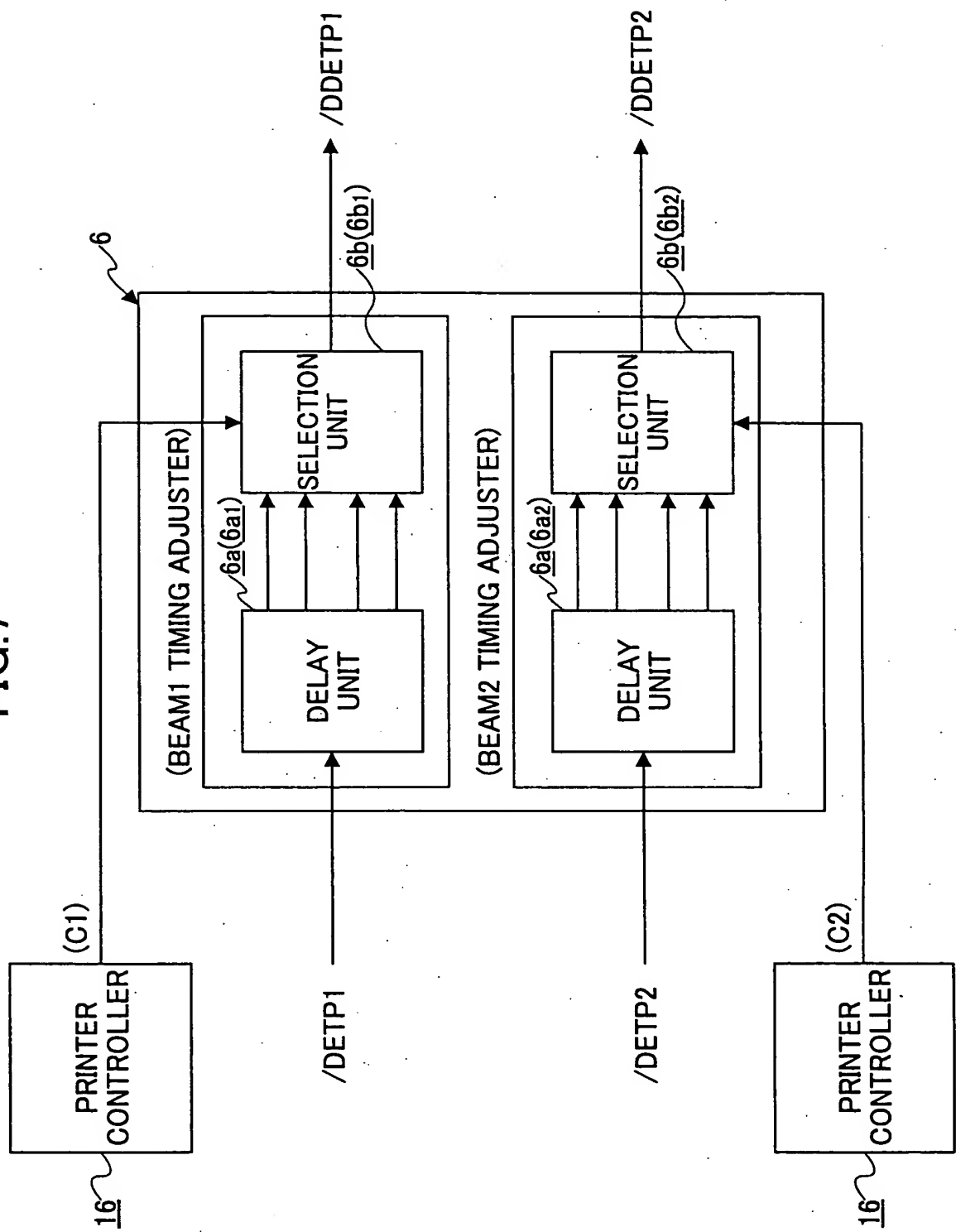


FIG.8

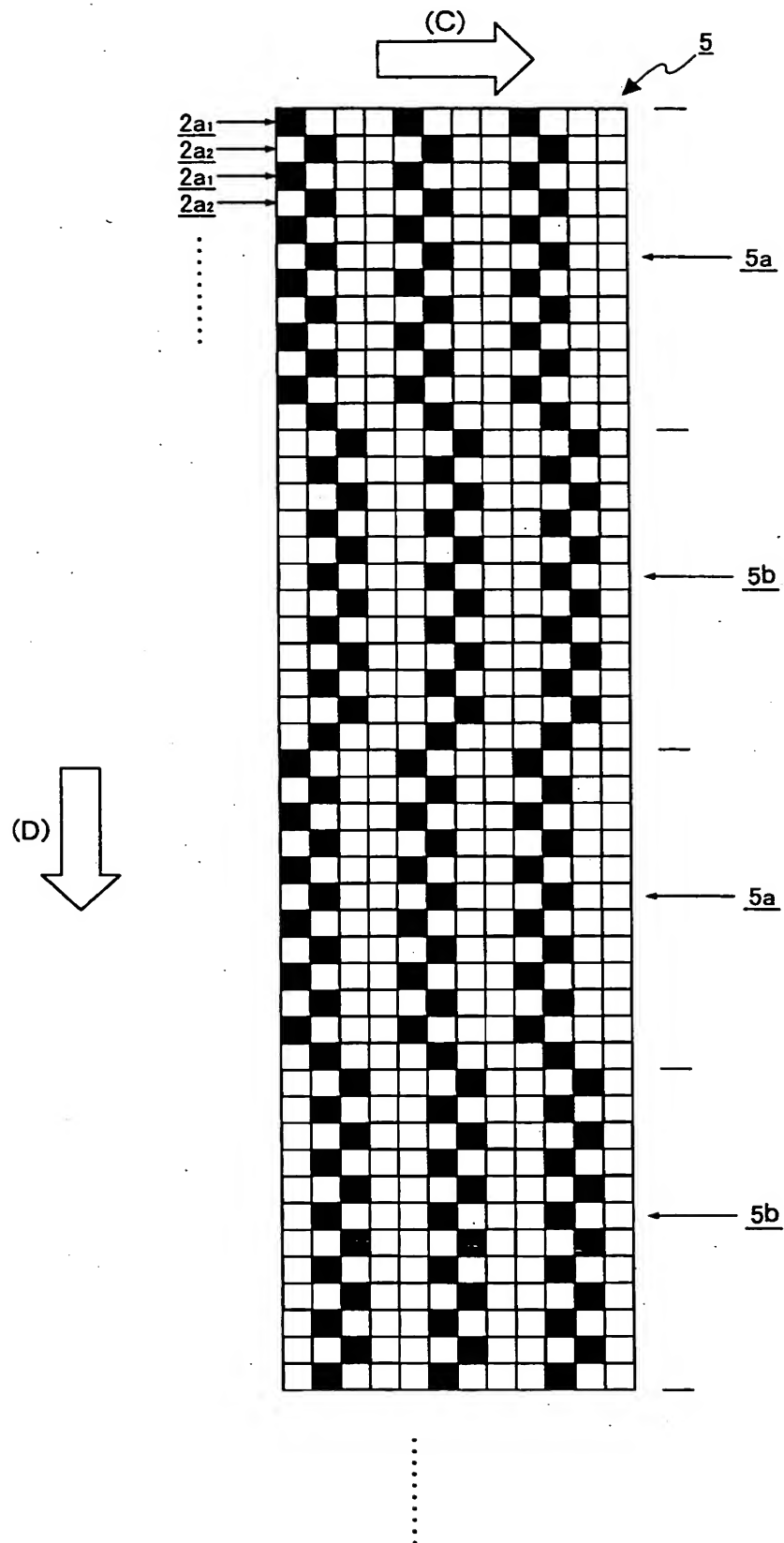


FIG.9

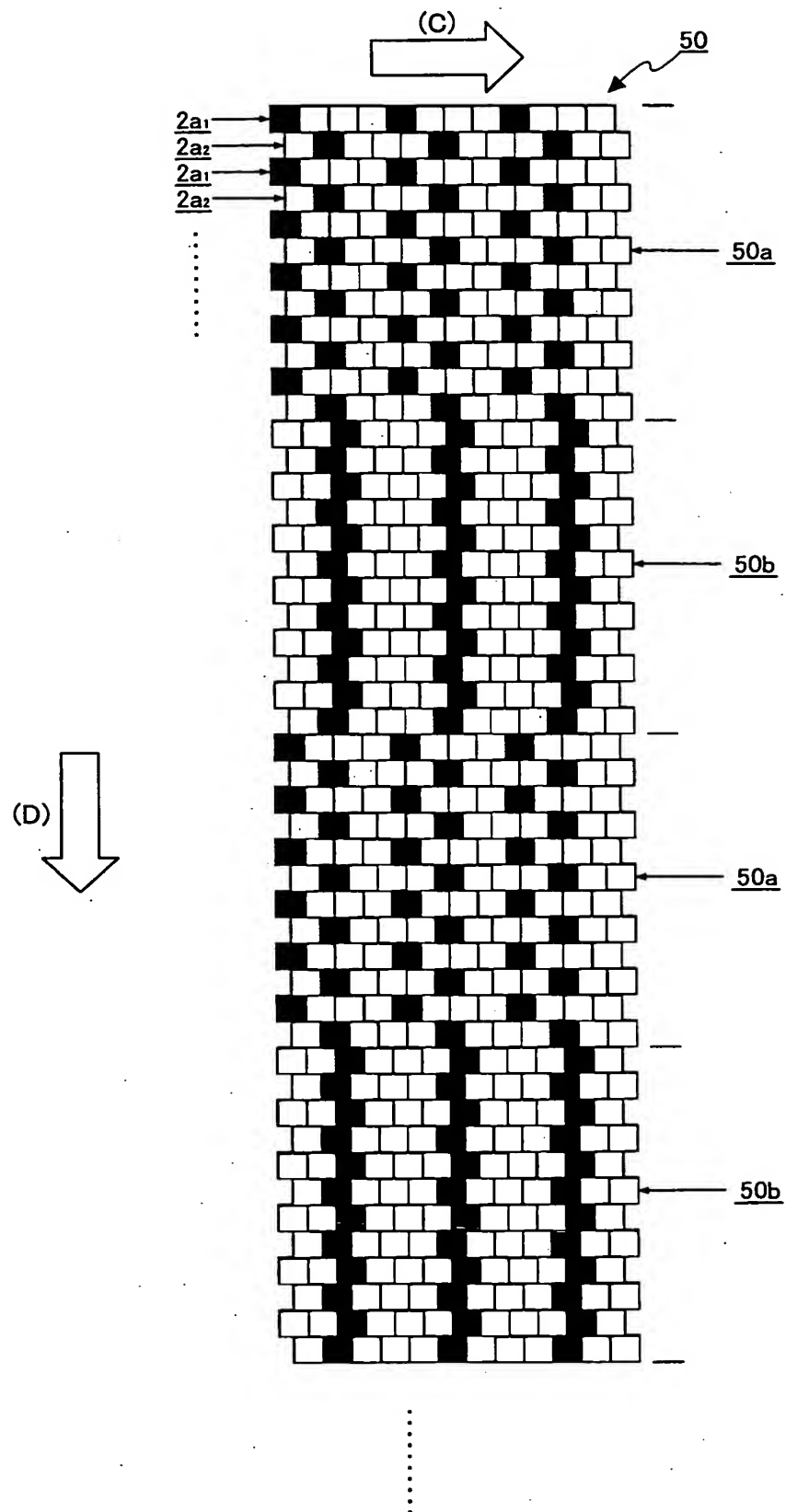


FIG. 10

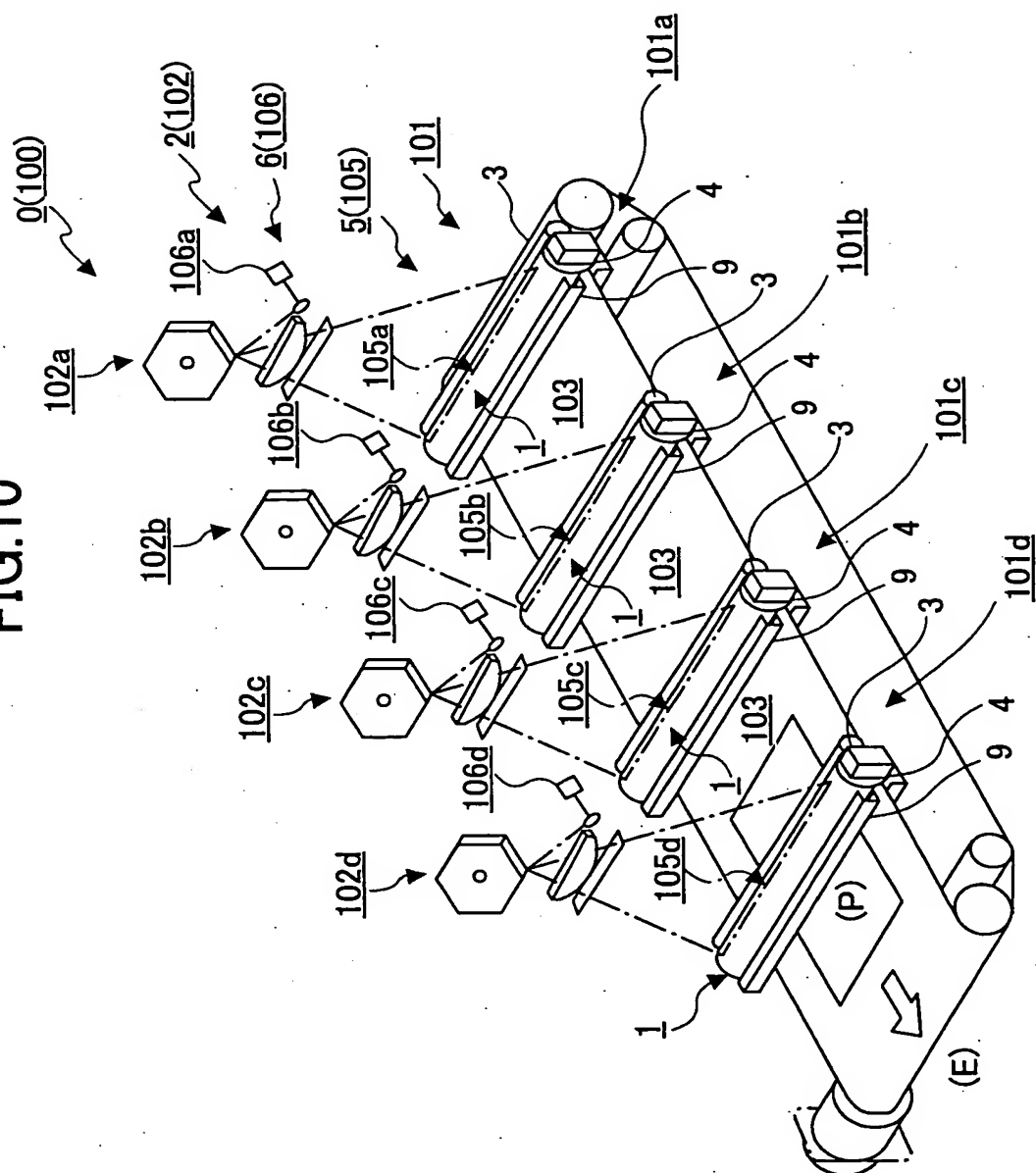
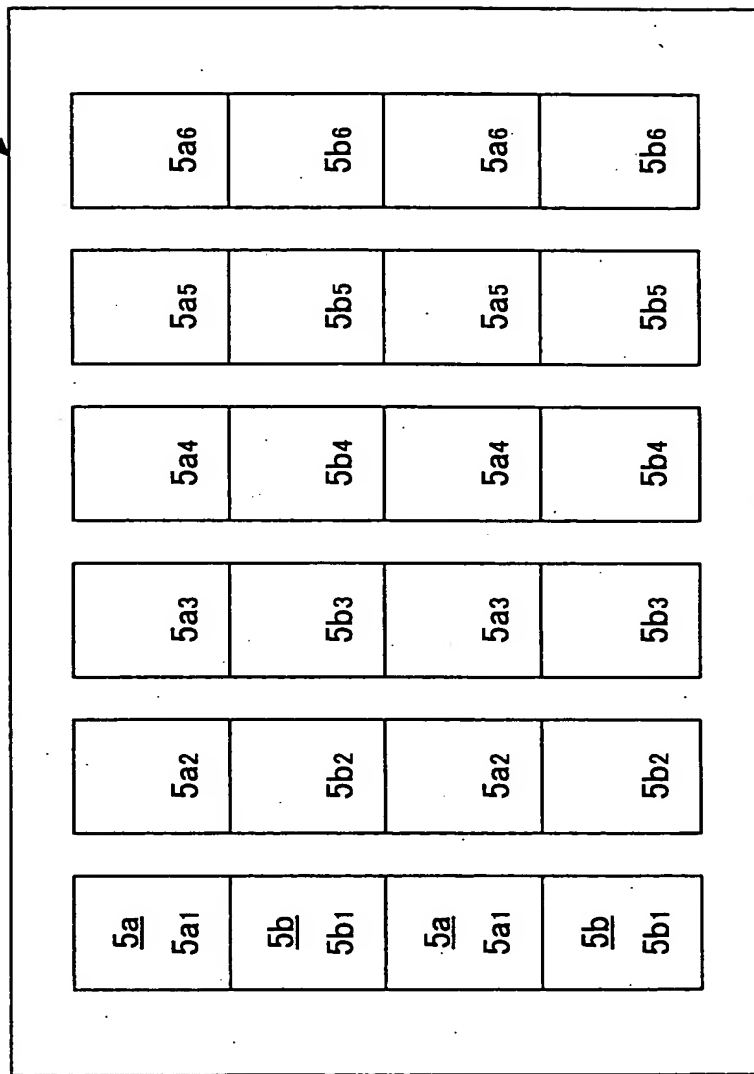


FIG.11

(C) 



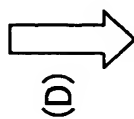
(D) 

FIG.12

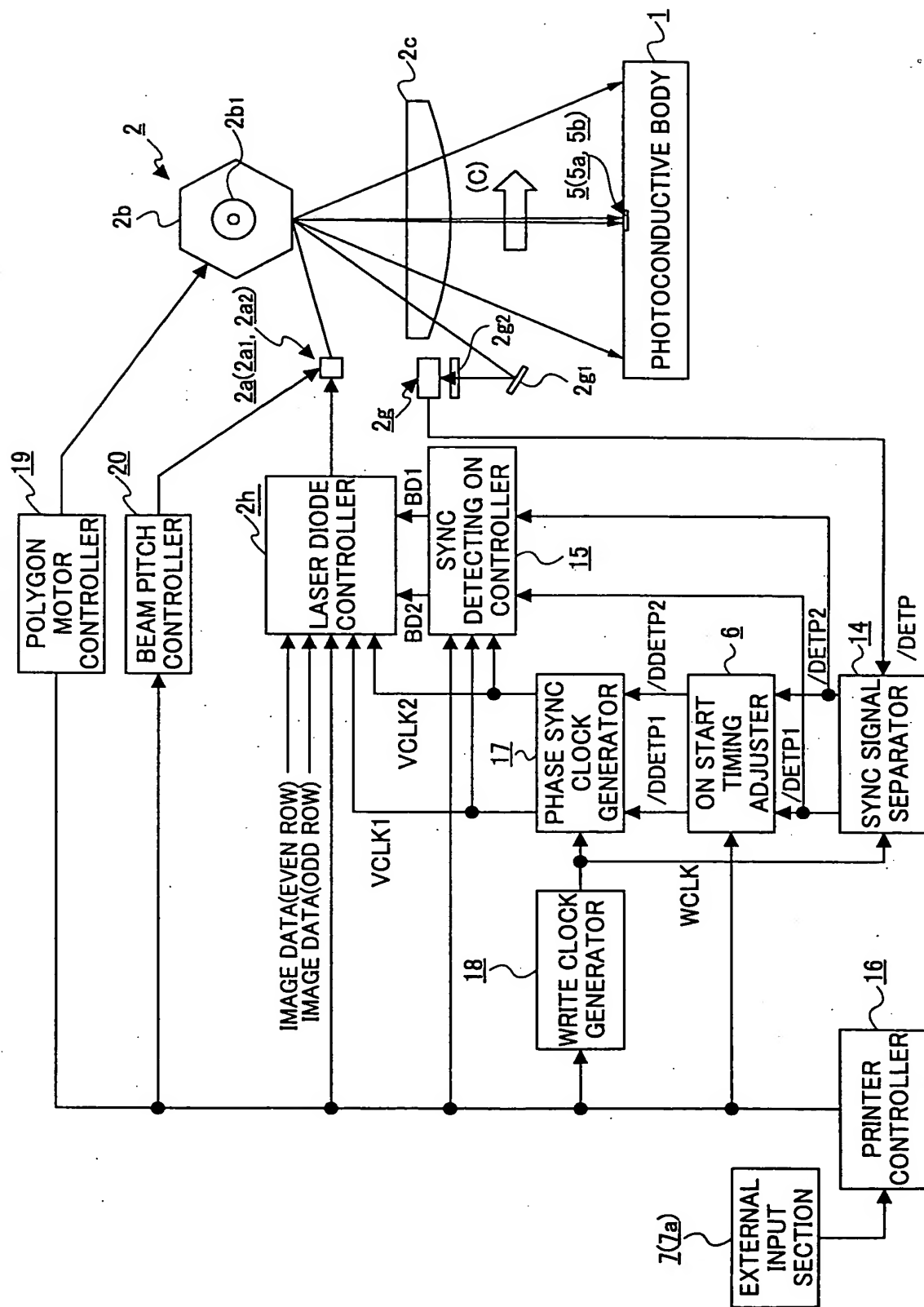


FIG.13

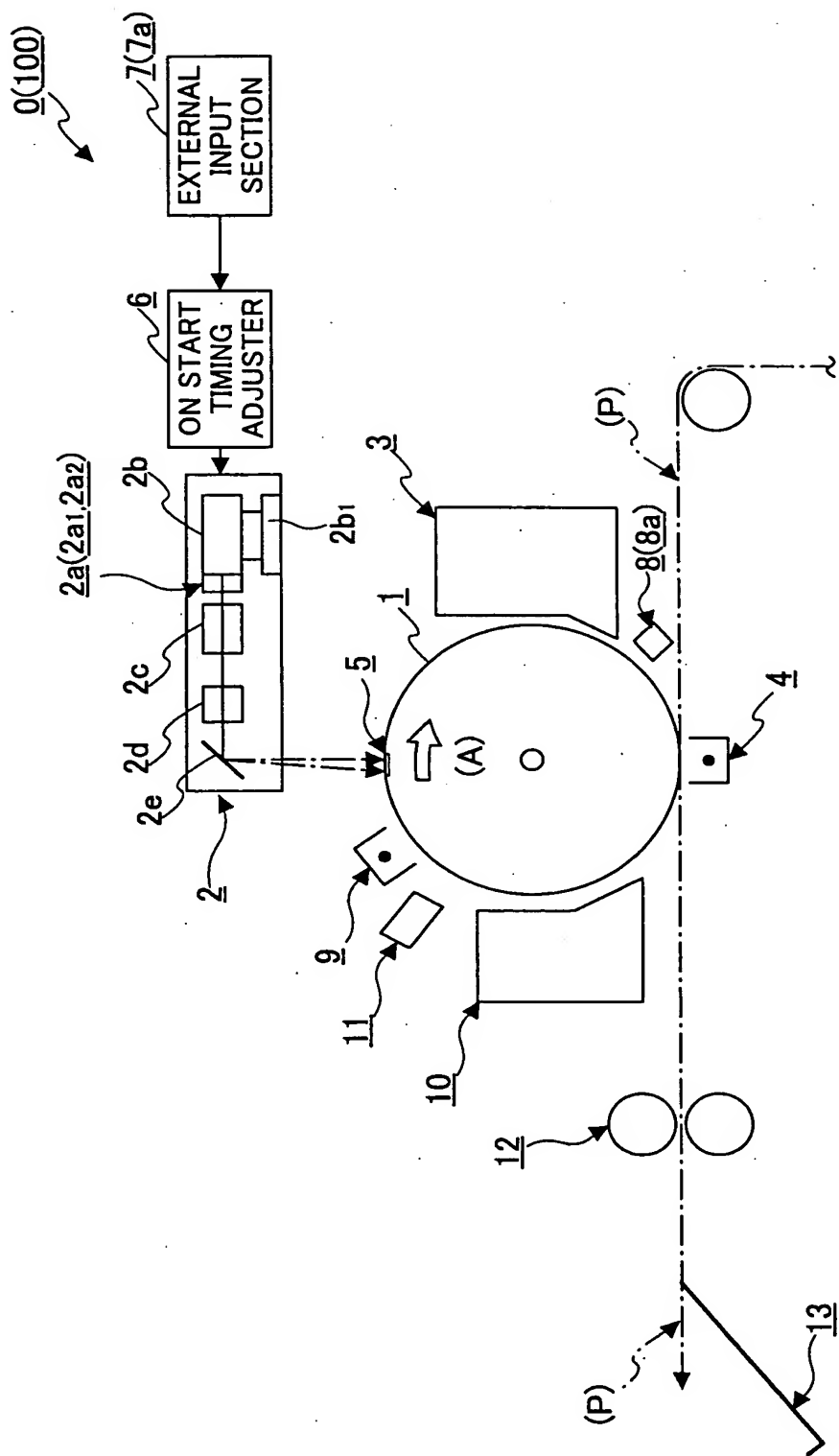


FIG. 14

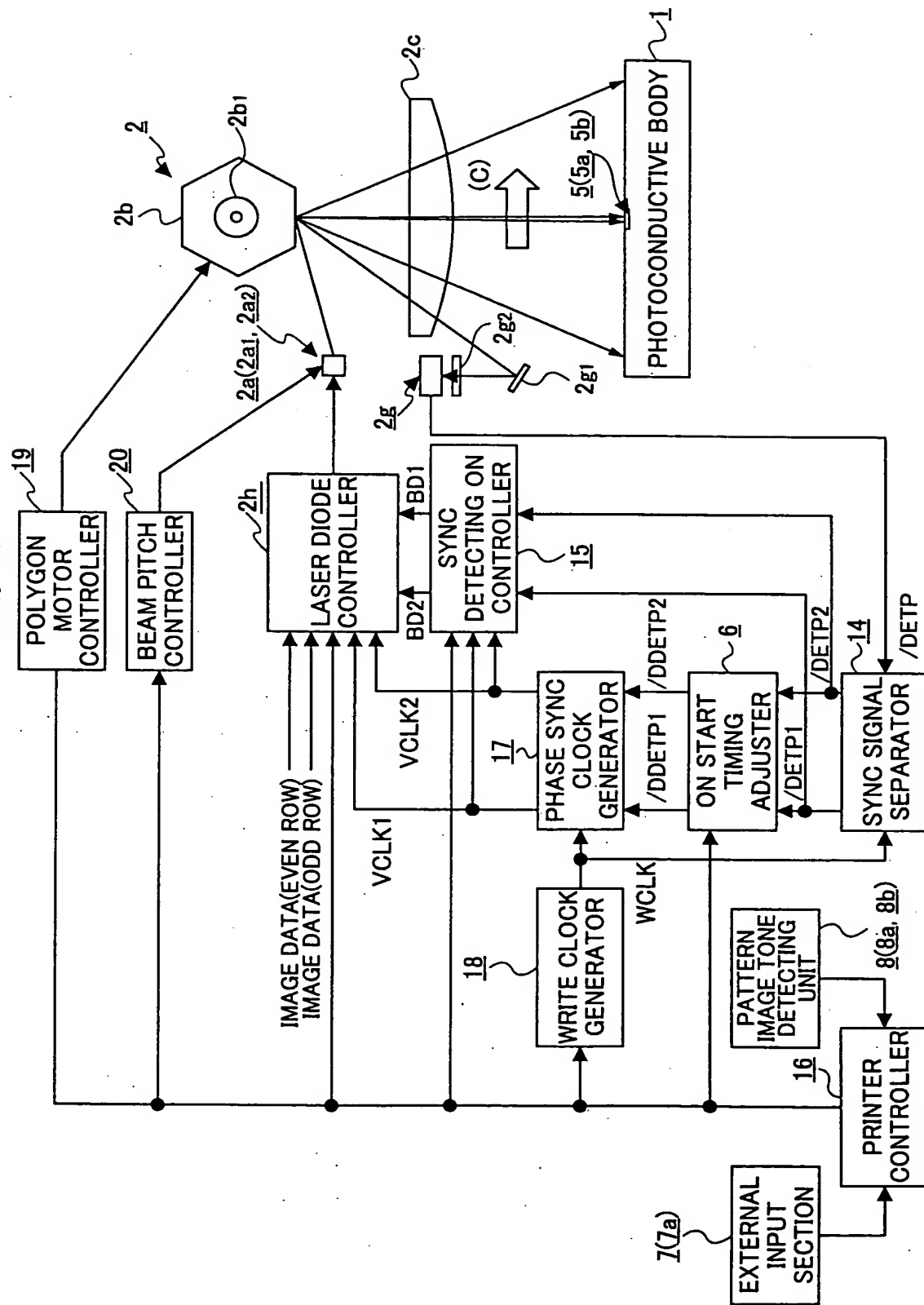


FIG.15

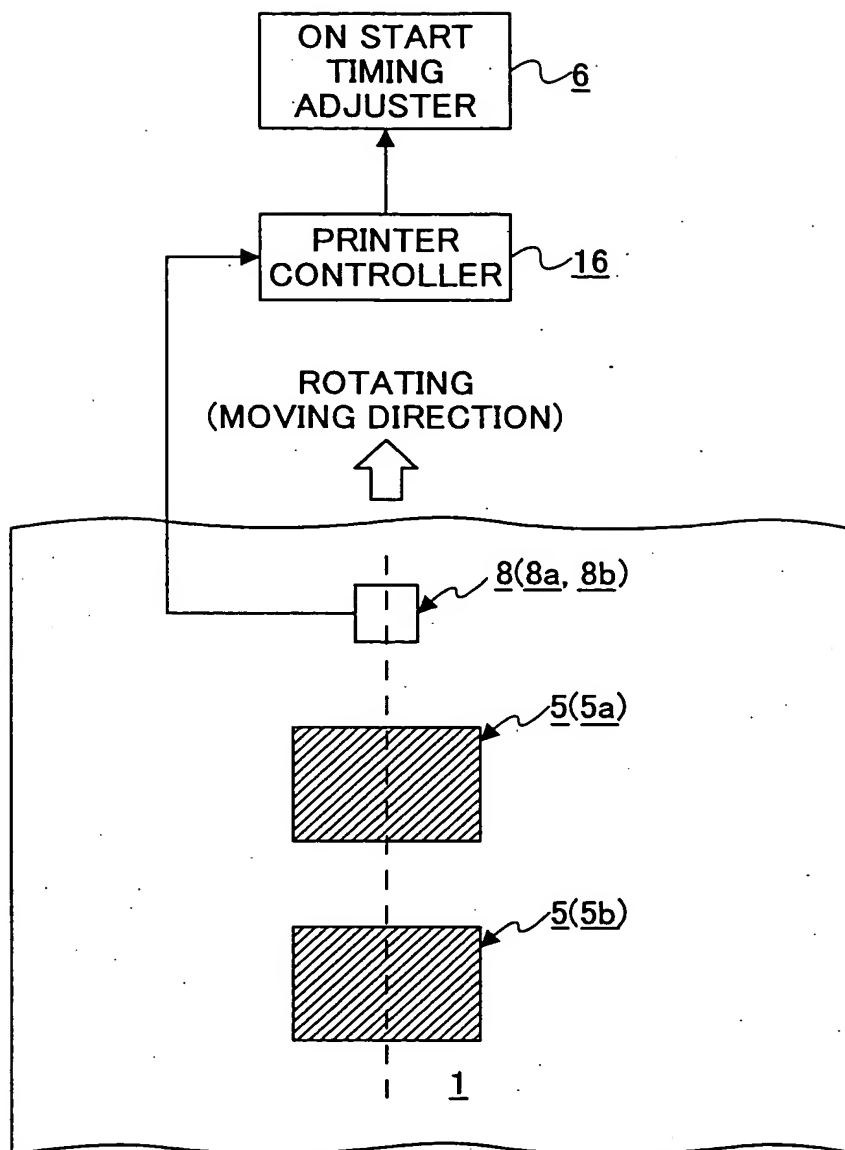


FIG.16

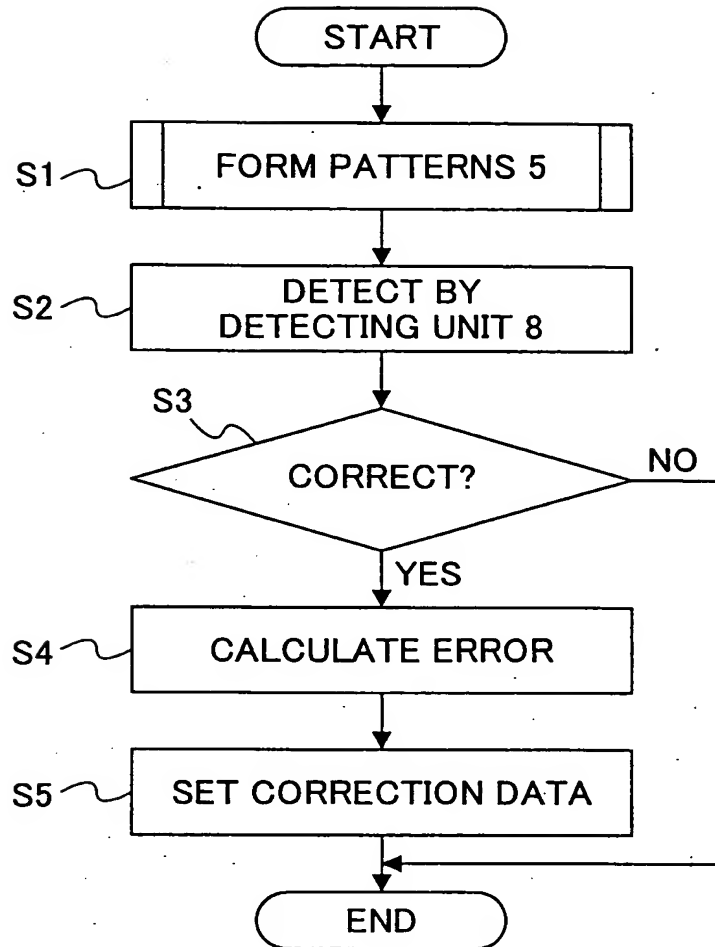


FIG.17

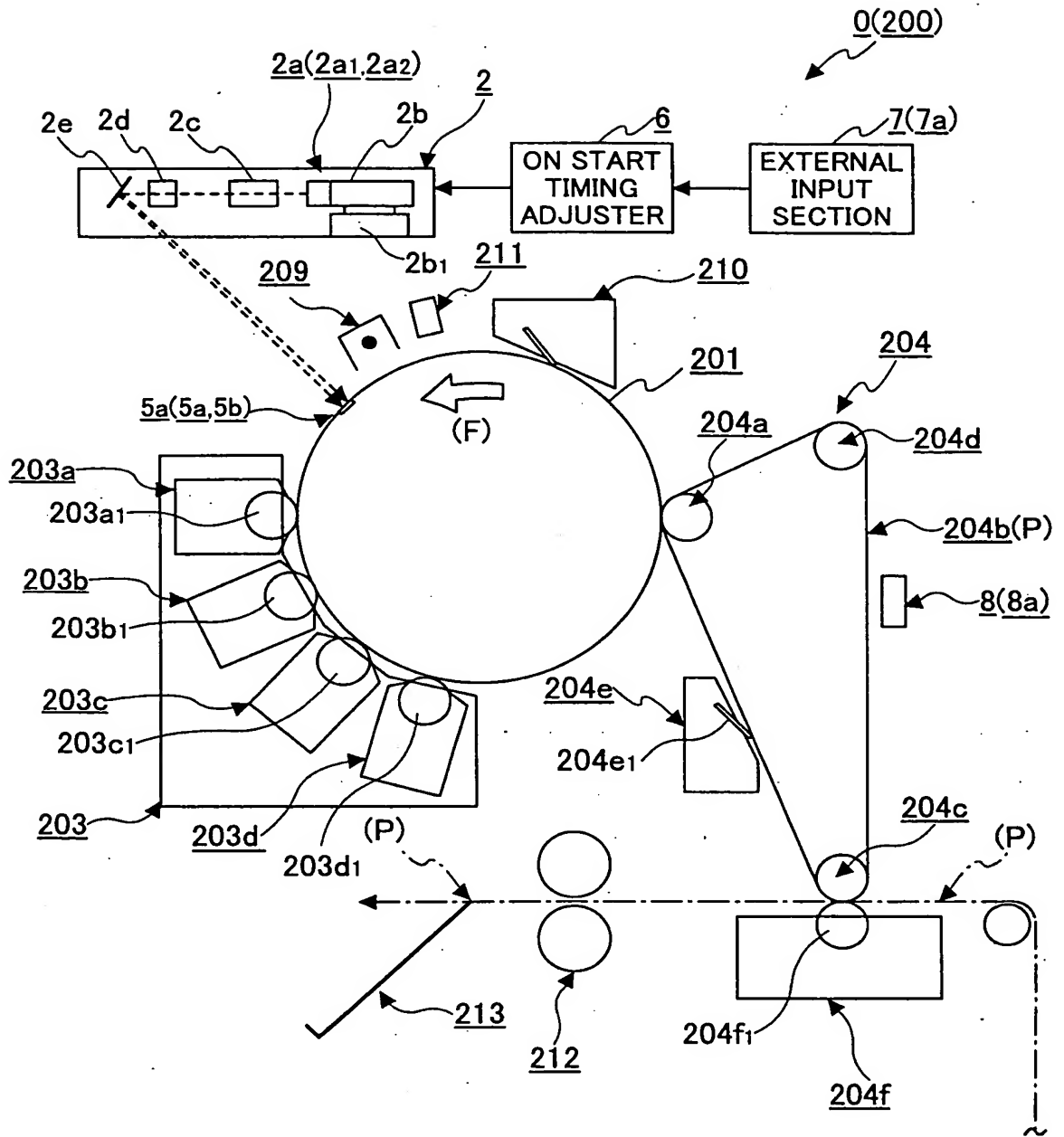


FIG.19

